WHAT IS CLAIMED IS:

1. A method for filtering a gas-flow, the method comprising:

(a) receiving the gas-flow through at least one of a duct and a housing containing a filter;

(b) placing the filter in motion; and

(c) impacting particulate matter suspended within the gas-flow with the filter, as a result of placing the filter in motion;

wherein upon impact the particulate matter is removed from the gas-flow.

2. The method of claim 1, wherein upon impact the particulate matter adheres to the filter and is thereby removed from the gas-flow.

3. The method of claim 1, wherein upon impact the particulate matter is physically trapped within the filter and is thereby removed from the gas-flow.

4. The method of claim 1, wherein upon impact the particulate matter is deflected from a direction of motion of the gas-flow and is thereby removed from the gas-flow.

5. The method of claim 1, wherein (b) further includes:

(b.1) placing the filter in one of a rotational motion and an oscillating motion.

6. The method of claim 1, wherein (b) further includes:

(b.1) placing the filter in motion in a direction substantially perpendicular to a direction of motion of the gas-flow.

7. The method of claim 1, wherein (b) further includes:

(b.1) placing the filter in motion at a rate of speed that is at least one of equal to and greater than a speed of the filtered air-flow scaled by a ratio of a filter pore average width to a filter pore average depth.

8. The method of claim 1, wherein (b) further includes:

(b.1) placing the filter in motion at a speed that is two to one-thousand times greater than a speed of the filtered air-flow scaled by a ratio of a filter pore average width to a filter pore average depth.

9. The method of claim 1, further comprising:

(d) receiving feedback related to at least one of an operational performance and an operational condition of the filter.

10. The method of claim 9, wherein the received feedback includes at least one of:

a measure of a pressure of the gas-flow before passing through the filter;

a measure of a pressure of the gas-flow after passing through the filter;

a measure of a pressure differential across the filter;

a measure of a particle buildup within the filter;

a measure of a speed of the filter;

a measure of a speed of the gas-flow;

a measure of at least one of a number of particles and a size of particles in the air-flow before passing through the filter; and

a measure of at least one of a number of particles and a size of particles in the air-flow after passing through the filter.

11. The method of claim 9, further comprising:

(e) adjusting a speed of the filter in response to the received feedback.

12. The method of claim 11, wherein (e) further includes:

(e.1) assessing the received feedback to determine whether to at least one of increase the filter speed and decrease the filter speed in response to the received feedback.

13. The method of claim 11, wherein (e) further includes:

(e.1) adjusting the speed of the filter to sustain a user specified performance criteria.

14. The method of claim 13, wherein the user specified performance criteria is at least one of:

a user specified pressure drop across the filter; and

a user specified efficiency in trapping particles of a user specified minimum size.

15. An apparatus for filtering a gas-flow, the apparatus comprising:

a housing to receive a gas-flow and to convey the gas-flow in a direction of motion through the housing;

a filter positioned within the housing;

a filter-motion-control module to place the filter in motion, said filter-motion-control module further comprising:

a motor to create mechanical energy in accordance with operator input received from the user interface; and

a drive-assembly module, connected between the motor and the filter to convey mechanical energy from the motor to the filter;

wherein the filter impacts particulate matter suspended within the gas-flow as a result of the filter motion and thereby removes the particulate matter from the gas-flow.

16. The apparatus of claim 15, wherein upon impact the particulate matter adheres to the filter and is thereby removed from the gas-flow.

17. The apparatus of claim 15, wherein upon impact the particulate matter is physically trapped within the filter and is thereby removed from the gas-flow.

18. The apparatus of claim 15, wherein upon impact the particulate matter is deflected from a direction of motion of the gas-flow and is thereby removed from the gas-flow.

19. The apparatus of claim 15, wherein the filter-motion-control module further

comprises:

a user-interface module to receive input from an operator.

20. The apparatus of claim 15, wherein the filter-motion-control module further comprises:

a speed-control module to control the speed of the filter motion.

21. The apparatus of claim 20, wherein the speed-control module is configured to place the filter in motion at a rate of speed that is at least one of equal to and greater than a speed of the filtered air-flow scaled by a ratio of a filter pore average width to a filter pore average depth.

22. The apparatus of claim 20, wherein the speed-control module is configured to place the filter in motion at a speed that is two to one-thousand times greater than a speed of the filtered air-flow scaled by a ratio of a filter pore average width to a filter pore average depth.

23. The apparatus of claim 15, wherein the filter-motion-control module is configured to place the filter in one of a rotational motion and an oscillating motion.

24. The apparatus of claim 15, wherein the filter-motion-control module is configured to place the filter in a direction of motion substantially perpendicular to the direction of motion of the gas-flow through the housing.

25. The apparatus of claim 19, wherein the filter-motion-control module further comprises:

a motor-control unit to receive input from an operator via the user-interface module and to control the motor in accordance with said received input.

26. The apparatus of claim 25, wherein the filter-motion-control module further

comprises:

a feedback sensor to send information related to at least one of a filter operational condition and a filter level of performance to the motor-control unit.

27. The apparatus of claim 26, wherein the motor-control unit further includes a feedback reception module to receive feedback sensor information related to at least one of:

a pressure of the gas-flow before passing through the filter;

a pressure of the gas-flow after passing through the filter;

a pressure differential across the filter;

a particle buildup within the filter;

a speed of the filter;

a speed of the gas-flow;

at least one of a number of particles and a size of particles in the air-flow before passing through the filter; and

at least one of a number of particles and a size of particles in the airflow after passing through the filter.

28. The apparatus of claim 26, wherein the motor-control unit further comprises:

a motor-speed-adjustment module to adjust the speed of the filter in response to the received feedback.

29. The apparatus of claim 15, wherein the motor-speed-adjustment module further comprises:

a performance module to determine whether to at least one of increase the motor speed and decrease the motor speed in order to sustain a performance criteria received via the user interface module.

30. The apparatus of claim 19, wherein the performance criteria is at least one of:

a user specified pressure drop across the filter; and

a user specified efficiency in trapping particles of a user specified minimum size.

31. A filter for filtering a gas-flow, comprising:

a filter material having a plurality of open spaces defined within, wherein an average cross-sectional area of the plurality of defined open spaces is greater than an average cross-sectional area of a smallest particle the filter is configured to remove from the gas-flow; and

a means for receiving mechanical energy to place the filter material in motion.

32. The filter of claim 31, wherein the filter material is configured as a hollow cylinder configured to rotate about a longitudinal center axis of the hollow cylinder.

33. The filter of claim 31, wherein the filter material is configured into a sheet with a substantially planar surface and configured to rotate about a center axis perpendicular to the planar surface of the filter material.

34. The filter of claim 31, wherein the filter material is planar and configured to oscillate within a plane.

35. The filter of claim 31, wherein the filter material includes at least one of a grid, a mesh and a plurality of bars.

36. The filter of claim 31, wherein the means for receiving mechanical energy is a hub centered upon a center axis of the filter material.

37. The filter of claim 31, wherein the means for receiving mechanical energy is located upon a perimeter of the filter material.

38. The filter of claim 31, wherein the means for receiving mechanical energy is configured to receive mechanical energy from a drive module to place the filter material in one of a rotational motion and an oscillating motion.

39. The filter of claim 31, wherein the means for receiving mechanical energy is configured to receive mechanical energy from a drive module to place the filter material in one of a rotational motion and an oscillating motion that is substantially perpendicular to a direction of motion of the filtered air-flow.

40. The filter of claim 31, wherein the means for receiving mechanical energy is configured to place the filter in motion in a direction substantially perpendicular to a direction of motion of the filtered gas-flow.